8 Jul 1992

VO4NN-A

VOLTMETER, VECTOR

1. GENERAL. This procurement requires a two-channel vector voltmeter.

2. CLASSIFICATION. Type II, Class 5, Style E, and Color R in accordance with MIL-T-28800 for shipboard applications.

3. MEASUREMENT REQUIREMENTS. The equipment shall measure voltage vectors by magnitude and phase within the minimum ranges, accuracies, and limits specified below.

3.1 Input characteristics.

3.1.1 Frequency range. 1 MHz to 1 GHz.

3.1.2 Isolation. 80 dB minimum.

3.1.3 Input RC. The input shall be selectable between 0.1 megohm or greater shunted by 2.5 pF or less and 50 ohms. The 50-ohm input connector shall be type N.

3.1.4 Voltage range. The equipment shall measure the following voltages:

a. Channel A: 1.5 mV to 1 Vrms from 1 MHz to 10 MHz.
300 uV to 1 Vrms from 10 MHz to 500 MHz.
500 uV to 1 Vrms from 500 MHz to 1 GHz.

b. Channel B: 20 uV to 1 Vrms.

3.1.5 Maximum input. AC: 2V peak. DC: ±50V.

3.2 Voltmeter characteristics.

3.2.1 Voltmeter display. A digital readout that displays rms voltage and dB shall be provided. An analog meter that has linear rms voltage and log dB scales is considered acceptable.

3.2.2 Voltmeter ranges. Selectable from 100 uV to 1V rms in 10 dB steps.

3.2.3 Absolute voltage accuracy.

a. 4%: 1 to 100 MHz.

b. 8%: 100 to 400 MHz.

c. 14%: 400 MHz to 1 GHz.

3.2.4 Voltage ratio accuracy.

a. 0.2 dB for -60 to 0 dB ranges from 1 to 200 MHz.

b. 0.2 dB for -60 to -10 dB ranges from 200 MHz to 1 GHz.

c. 0.5 dB for -70 and +10 dB ranges from 1 to 200 MHz.

d. 0.5 dB for -70 and 0 dB ranges from 200 MHz to 1 GHz.

e. 1.5 dB for +10 dB range from 200 MHz to 1 GHz.

3.2.5 Residual noise. The residual noise shall be 10 uV or less as indicated on the meter.

3.3 Phasemeter characteristics.

3.3.1 Phase range. The zero-centered phase range meter shall provide end-scale ranges of 180°, 60°, 18°, and 6°. A digital phase indicator with a 3-1/2-digit display is considered acceptable.

3.3.2 Resolution. 0.2° or less.

3.3.3 Meter offset. 180° in 10° steps.

3.3.4 Phase accuracy. 1.0° at a single frequency with equal voltage at Channels A and B.

3.3.5 Phase accuracy versus voltage. Phase accuracy versus voltage shall be in accordance with table I.

TABLE I. Phase Accuracy Versus Voltage.

ACCESSORY	PHASE ACCURACY	VOLTAGE RANGE CHANNEL A	VOLTAGE RANGE CHANNEL B	FREQUENCY MHz
50-ohm Type N	3°	1.5 mV to 300 mV	100 uV to 300 mV	1-10
	3°	300 uV to 300 mV	100 uV to 300 mV	10-500
	3°	500 uV to 100 mV	100 uV to 100 mV	500-1,000
10:1 Divider	4°	1.5 mV to 3V	1 mV to 3V	1-10
	4°	1 mV to 3V	1 mV to 3V	10-100
Isolator	6°	1.5 mV to 300 mV	100 uV to 300 mV	1-10
	6°	300 uV to 300 mV	100 uV to 300 mV	10-200
Note: The phase accuracy is added to the specified single-frequency accuracy when the voltages at Channels A and B are not equal.				

3.4 Recorder outputs. Recorder outputs for the voltmeter and phasemeter shall be provided.

4. GENERAL REQUIREMENTS.

4.1 Power source. MIL-T-28800 nominal power source requirements are invoked. Maximum power consumption: 40W.

4.2 Weight. 20 kg (44 lb) maximum.

4.3 Digital interface. A digital interface shall be provided in accordance with MIL-T-28800.

4.4 Lithium batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. Requests for approving the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.5 Accessories. The following accessories shall be furnished with the equipment:

a. Two 50-ohm feed through tees.

b. Two 10:1 dividers.

c. Two isolators.

d. Two BNC adapters.

e. Ground clips.

f. Replacement probe tips.

g. One 50-ohm power splitter.

h. Two 50-ohm terminations.

i. One type N(m) shorting plug.